LXXI.—*On a Collection of Fishes from Gallaland.*

By G. A. Boulenger, F.R.S.

Thanks to the generosity of Mr. W. N. M°Millan, the British Museum has recently received a large collection of fishes made by Mr. P. C. Zaphiro during a trip to Kaffa and Lake Rudolf. The great care bestowed by Mr. Zaphiro on the preservation and labelling of the specimens, about 400 in number, most of which are accompanied by notes on the coloration in the fresh state, and the great number of new or rare forms from comparatively little-known waters*, render this collection a very valuable one, by which our knowledge of African ichthyology is further advanced. The collection was made in five distinct hydrographic systems :— 1. The Blue Nile; 2. The Omo with Lake Rudolf; 3. Lakes Abaya and Ganjule with the Sagan River, which connects them with Lake Stephanie †; 4. Lakes Zwai and Suksuki; 5. The Hawash. According to Mr. Zaphiro, Lake Stephanie contains no fishes. The species represented in the collection are first enumerated in hydrographical order ‡.

The collection made by Mr. Zaphiro has added to the list of the species of *Barbus* of the *B. Bynni* group, the variety of which in Southern Ethiopia and East Africa constitutes so striking a feature. Undoubtedly fast-running mountain-streams are more favourable to the existence of Cyprinids than of fishes of a more strictly tropical character. But it, nevertheless, remains a puzzling fact that these *Barbus* should have split up into such a number of allied forms, whilst the *Labeo*, seemingly still better adapted for waters of a torrential nature, have remained unaltered, only four species, three of them of wide distribution in Africa, being known from the district.

* *Cf.* Günther, P. Z. S. 1896, p. 217; Vinciguerra, Ann. Mus. Genova, (2) xvii. 1897, p. 343, and xix. 1898, p. 240; Boulenger, Ann. & Mag. Nat. Hist. (7) x. 1902, p. 421, and P. Z. S. 1903, ii. p. 328; Pellegrin, Bull. Mus. Paris, 1905, p. 290.

† A communication between these lakes appears to exist only at certain seasons, according to Oscar Neumann (Geogr. Journ. xx. 1902, p. 384). "The sources of the Sagan lie east of the south end of Lake Abaya [Pagade]. But there is a broad channel connecting Lake Ganjule [Margherita] with the Sagan. The bed of this channel was dry at the time, but there were some large and small waterpools scattered over it. When the water rises in L. Ganjule for about 5 inches, which will probably take place every year at the beginning of the rainy season, a large river will run from Lake Ganjule to the Sagan."

‡ *Cf.* maps in Bottego's 'L' Omo' (Milan, 1899) and in O. Neumann's paper in Geogr. Journ. xx. (1902).

The additions to the fish-fauna of Lake Rudolf which this collection affords (*Gymnarchus niloticus*, *Heterotis niloticus*) only further emphasize the almost purely Nilotic character of this fauna, as remarkable a fact as is, on the other hand, the very insignificant proportion of Nile elements in the fish-fauna of Lake Victoria. Lakes Abaya–Margherita also possess some fishes particularly suggestive of the Nile, but here they are associated with a preponderating number of forms characteristic of the eastern parts of Africa.

It is worthy of note that nearly all the species of fishes which by their association impress a so strikingly Nilotic character on the fauna of Lake Rudolf belong to the set which extends westwards to Lake Chad and the Senegal and Niger.

I.—System of the Blue Nile.

1. Gudar River, a fast-running stream, about 25 yards wide, flowing from the Rogghe Mountains northwards to the Blue Nile. Altitude 3400 feet.
   Barbus plagiostomus, *B. gudaricus*.

2. Metti River, a fast-running stream, about 20 yards wide, flowing from Tuludimtu northwards to the Gudar River. Altitude 3500 feet.
   Discognathus dembeensis, *Varicorhinus beso*, *Barbus gudaricus*.

3. Didessa River, about 60 yards wide, flowing from Guma northwards to the Blue Nile. Altitude 1500 feet.
   Labeo Forskalii, *Discognathus dembeensis*, *Varicorhinus beso*, *Barbus surkis*, *B. intermedius*, *B. Zaphiri*, *B. affinis*, *B. nedgia*.

4. Juju River, about 10 yards wide, flowing from the hills of Guma to the Didessa River. Altitude 2000 feet.
   Labeo Forskalii, *Discognathus dembeensis*, *Varicorhinus beso*, *Barbus intermedius*, *B. leptosoma*, *B. eumystus*.

5. Urgessa River, about 15 yards wide, flowing north-west to the Wama River, a tributary of the Didessa River. Altitude 2300 feet.
   Varicorhinus beso, *Barbus intermedius*.

II.—System of the Omo.

1. Omo River at Kullo, width 150–200 yards. Altitude 2000 feet.
   Labeo cylindricus, *Barbus Bottegi*.

2. Cojeb River, about 50 to 60 yards wide (in the rainy season), flowing from Guma and the Cialla hills to the Omo. Altitude 2500 feet.
   Alestes macrolepidotus, *Heterobranchus longifilis*.

3. Ergino River, about 20 yards wide, flowing from the Basketo hills northward to the Omo. Altitude 3000 feet.
Labeo niloticus, L. cylindricus, Barbus intermedius, B. Duchesnii, B. Gregorii, Heterobranchus longifilis, Bagrus docmac, Tilapia nilotica.

4. Gibe River, a fast-running stream about 20 yards wide, coming from the plains of Gorombi (Leka), supposed to be the source of the Omo, and flowing southwards. Altitude 2800 feet.
Discognathus dembeensis, Barbus nedgia.

5. Wondinak River, 3 yards wide, flowing north-west to the Gibe River. Altitude 3000 feet.
Barbus oreas.

6. Zendo River, about 15 yards wide, flowing from the hill Anko eastwards to the Maze River, an affluent of the Omo. Altitude 4300 feet.
Labeo cylindricus, Barbus Gregorii, Barilius Loati.

7. Lake Rudolf, north-east end. Altitude 1800 feet.
Polypterus senegalus, Gymnarchus niloticus, Heterotis niloticus, Synodontis frontosus, Tilapia nilotica.

III.—Sagan River and Lakes Abaya (Pagade) and Ganjule (Margherita) *.

1. Sagan River at Wondo, a fast-running stream about 15 yards wide. Altitude 2800 feet.
Labeo niloticus, L. cylindricus, Barbus Duchesnii, Schilbe mystus, Bagrus docmac, Synodontis schall.

2. Delbena River, a fast-running stream about 10 yards wide, flowing from the hills of Gandulla westwards to the Sagan River. Altitude 3200 feet.
Labeo cylindricus.

3. Gato River, a fast-running stream about 15 yards wide, flowing from the hills of Gandulla westwards to the Sagan River. Altitude 3700 feet.
Labeo cylindricus, Barbus nedgia.

4. Zeissi River, a very fast-running stream about 10 yards wide, flowing from the hills of Zeissi eastwards to Lake Abaya. Altitude 3000 feet.
Labeo cylindricus, Barbus intermedius, B. affinis.

* There is great confusion in the naming of these two lakes. The larger, northern lake appears on many maps, including Bottego's, as L. Margherita. Both are also known as Lakes Abaya.

5. Elgo River, a very fast-running stream about 15 yards wide, flowing from the hills of Gamu eastwards to Lake Abaya. Altitude 3000 feet.
Barbus Duchesnii, B. affinis, Clarias Robecchii.

6. Sire River, a fast-running stream about 30 yards wide, flowing from the highlands of Gamu to Lake Abaya. Altitude 3000 feet.
Barbus intermedius, B. affinis, Clarias lazera.

7. Ganda River, about 15 yards wide, flowing from the highlands of Gamu to Lake Ganjule (Margherita). Altitude 3000 feet.
Labeo cylindricus, Barbus intermedius, B. Duchesnii.

8. Alaba River, a fast-running stream about 20 yards wide, flowing from the plains of Kambata to Lake Ganjule. Altitude 6000 feet.
Barbus Gregorii, B. alticola.

9. Lake Ganjule or Margherita. Altitude 3000 feet.
Hydrocyon Forskalii, Labeo cylindricus, Barbus Macmillani, B. Ruspolii, B. Gregorii, B. nedgia, B. Margaritæ, Synodontis schall, Tilapia nilotica.

10. Zuja River, 30 yards wide, flowing from the hill Marta southwards to Lake Stephanie. Altitude 4200 feet.
Labeo cylindricus, Barbus Gregorii, B. nedgia.

11. Barja River, a fast-running stream about 10 yards wide, flowing from the hills of Sangana and Bako to the Zuja River. Altitude 4250 feet.
Labeo cylindricus, Barbus Gregorii.

IV.—Lakes Zwai and Suksuki.

1. Lake Zwai. Altitude 4000 feet.
Discognathus quadrimaculatus, Barbus zuaicus, B. oreas, Tilapia nilotica.

2. Lake Suksuki. Altitude 3900 feet.
Tilapia nilotica.

3. Suksuki River, connecting the two lakes.
Barbus oreas.

4. Maki River, flowing into Lake Zwai.
Barbus oreas, B. Gregorii.

V.—System of the Hawash.

1. Hawash River at Zekuala, about 20 yards wide. Altitude 4100 feet.
Varicorhinus beso, Barbus oreas, B. Gregorii.

2. Akaki River, a stream 10 to 12 yards wide, flowing from the hills of Legadadi southwards to the Hawash. Altitude 4500 feet.

Discognathus quadrimaculatus, Barbus paludinosus, B. plagiostomus, B. oreus.

Systematic List.

Polypteridæ.

1. *Polypterus senegalus*, Cuv.—Lake Rudolf.

Mormyridæ.

2. *Gymnarchus niloticus*, Cuv.—Lake Rudolf.

Osteoglossidæ.

3. *Heterotis niloticus*, Cuv.—Lake Rudolf.

Characinidæ.

4. *Hydrocyon Forskalii*, Cuv.—Lake Ganjule (Margherita).

5. *Alestes macrolepidotus*, Cuv.—Cojeb River.

Cyprinidæ.

6. *Labeo niloticus*, Forsk.—Ergino River, Sagan River.

7. *Labeo Forskalii*, Rüpp.—Didessa River, Juju River.

8. *Labeo cylindricus*, Peters.—Omo River, Ergino River, Zendo River, Sagan River, Delbena River, Zeissi River, Ganda River, Lake Ganjule (Margherita), Zuja River, Barja River.

9. *Discognathus dembeensis*, Rüpp.—Metti River, Didessa River, Juju River, Gibe River.

10. *Discognathus quadrimaculatus*, Rüpp. — Lake Zwai, Akaki River.

11. *Varicorhinus beso*, Rüpp.—Metti River, Didessa River, Juju River, Urgessa River, Hawash River.

12. *Barbus paludinosus*, Peters.—Akaki River.

13. *Barbus surkis*, Rüpp.—Didessa River.

14. *Barbus intermedius*, Rüpp.—Didessa River, Juju River, Urgessa River, Ergino River, Zeissi River, Sire River, Ganda River.

15. *Barbus zuaicus*, sp. n.

Depth of body $3\frac{2}{5}$ times in total length, length of head 4 times. Snout rather pointed, $3\frac{1}{3}$ times in length of head; diameter of eye 4 times in length of head, interorbital width $3\frac{1}{3}$ times; mouth inferior, its width 5 times in length of head; lips moderately developed, interrupted on the chin; barbels two on each side, equal in length, twice diameter of eye. Dorsal IV 9; last simple ray very strong, bony, straight, $\frac{3}{4}$ length of head. Anal III 5. Pectoral a little shorter than head. Ventral below anterior rays of dorsal. Caudal peduncle nearly twice as long as deep. Scales 33 $\frac{5\frac{1}{2}}{5\frac{1}{2}}$, 3 between lateral line and ventral, 12 round caudal peduncle. Dark olive above, silvery white beneath.

Total length 190 mm.

A single specimen from Lake Zwai.

Well distinguished from the species with interrupted lower lip by the very long barbels.

16. *Barbus plagiostomus*, Blgr.—Gudar River, Akaki River.

17. *Barbus Macmillani*, sp. n.

Depth of body equal to or a little less than length of head, $3\frac{1}{2}$ to 4 times in total length. Snout rounded, 3 times in length of head; diameter of eye $4\frac{1}{3}$ to $4\frac{1}{2}$ times in length of head, interorbital width $3\frac{1}{3}$ to $3\frac{1}{2}$ times; mouth inferior, forming a broken arch, a feebly curved transverse line in front, its width 4 times in length of head; lips very feebly developed, confined to the sides; a thin horny sheath, with a blunt keel, covers the jaws; barbels two on each side, anterior once to once and a half length of eye, posterior once and $\frac{1}{5}$ to once and $\frac{3}{5}$ length of eye. Dorsal IV 8–9, free edge emarginate; last simple ray very strong, bony, not serrated, straight, $\frac{3}{5}$ to $\frac{3}{4}$ length of head. Anal III 5. Pectoral a little shorter than head. Ventral below anterior rays of dorsal. Caudal peduncle once and $\frac{1}{2}$ to once and $\frac{3}{4}$ as long as deep. Scales 30–33 $\frac{5\frac{1}{2}}{4\frac{1}{2}}$, 2 or $2\frac{1}{2}$ between lateral line and ventral, 12 round caudal peduncle. Dark olive above, the scales blackish at the base, silvery white beneath.

Total length 220 mm.

Five specimens from Lake Ganjule (Margherita).

Closely allied to *B. plagiostomus*, Blgr. Distinguished by the longer head and the longer barbels.

18. *Barbus Bottegi*, sp. n.

Depth of body 3 to 3½ times in total length, length of head 4 to 4⅓ times. Snout rounded, 3¼ to 3½ times in length of head; diameter of eye 4 to 5 times in length of head, interorbital width 2⅔ to 3 times; mouth inferior, forming a broken arch, a feebly curved transverse line in front, its width 3½ to 4 times in length of head; lips very feebly developed, confined to the sides; a thin horny sheath, with a blunt keel, covers the jaws; barbels two on each side, anterior once and ¼ to once and ⅓ length of eye, posterior once and ⅓ to once and ½. Dorsal IV 9, free edge emarginate; last simple ray very strong, bony, not serrated, feebly curved, ⅔ to ¾ length of head. Anal III 5. Pectoral as long as head or a little shorter. Ventral below anterior rays of dorsal. Caudal peduncle once and ½ as long as deep. Scales 28–30 $\frac{5\frac{1}{2}}{4\frac{1}{2}}$, 2 or 2½ between lateral line and ventral, 12 round caudal peduncle. Silvery, the dorsal region darker, with the scales dark-edged, lower parts pure white; fins greyish, or pectorals, ventrals, and anal reddish; a yellow line round the pupil.

Total length 245 mm.

Three specimens from the Omo River at Kullo and one from the Gibe River.

Distinguished from *B. plagiostomus* by longer barbels and fewer scales in the lateral line, from *B. Macmillani* by the deeper body and the broader interorbital space.

19. *Barbus Zaphiri*, sp. n.

Depth of body 3⅔ times in total length, length of head 3¼ times. Snout rounded, 3½ times in length of head, eye 6 times, interorbital width 4 times; mouth terminal, lower jaw slightly projecting; width of mouth 4 times in length of head; lips well developed, interrupted on the chin; barbels two on each side, nearly equal, about once and ⅓ diameter of eye. Dorsal IV 9, free edge emarginate; last simple ray very strong, bony, not serrated, feebly curved, about ⅔ length of head. Anal III 5. Pectoral about ⅔ length of head. Ventral slightly in advance of vertical of origin of dorsal. Caudal peduncle once and ⅔ as long as deep. Scales 31 $\frac{5\frac{1}{2}}{5\frac{1}{2}}$, 2½ between lateral line and ventral, 14 round caudal peduncle. Dark olive above, silvery white beneath.

Total length 230 mm.

A single specimen from the Didessa River.

Near *B. gorguari*, Rüpp.; differing in the longer barbels.

20. *Barbus Ruspolii*, Vinciq.*—Lake Ganjule (Margherita).

21. *Barbus oreas*, Blgr.—Wondinak River, Lake Zwai, Suksuki River, Maki River, Hawash River, Akaki River.

22. *Barbus leptosoma*, Blgr.—Juju River.

23. *Barbus gudaricus*, sp. n.

Depth of body $3\frac{2}{3}$ times in total length, length of head $3\frac{4}{5}$ to 4 times. Snout rounded, 3 to $3\frac{1}{2}$ times in length of head; eye 5 to $5\frac{1}{2}$ times in length of head, interorbital width 3 times; mouth inferior, its width $3\frac{2}{3}$ to 5 times in length of head; lips well developed, the lower continuous across the chin and forming a small rounded median lobe; barbels two on each side, anterior a little longer than eye, posterior once and $\frac{1}{3}$ to once and $\frac{1}{2}$ length of eye. Dorsal IV 9, free edge emarginate; last simple ray very strong, bony, not serrated, nearly straight, $\frac{2}{3}$ to $\frac{3}{4}$ length of head. Anal III 5. Pectoral a little shorter than head. Ventral below anterior rays of dorsal. Caudal peduncle once and $\frac{1}{2}$ to once and $\frac{2}{3}$ as long as deep. Scales 28–30 $\frac{5\frac{1}{2}}{4\frac{1}{2}}$, $2\frac{1}{2}$ between lateral line and ventral, 12 round caudal peduncle. Dark olive above, silvery white beneath.

Total length 265 mm.

Two specimens from the Gudar River and two from the Metti River, affluent of the Gudar River.

Near *B. oreas*, Blgr.; distinguished by the lower number of scales in the lateral line.

24. *Barbus Duchesnii*, Blgr.—Ergino River, Sagan River, Elgo River, Ganda River.

25. *Barbus affinis*, Rüpp.—Didessa River, Zeissi River, Elgo River, Sire River.

26. *Barbus Gregorii*, Blgr.†—Ergino River, Zendo River, Alaba River, Lake Ganjule (Margherita), Zuja River, Barja River, Maki River, Hawash River.

* This species was founded on a badly preserved dry specimen from Lake Ganjule. It proves to be closely allied to *B. bynni*, differing in having only $2\frac{1}{2}$ series of scales between the lateral line and the ventrals. The spine of the dorsal fin is remarkably strong and much longer than the head.

† *B. Neuvillii*, Pellegr., is probably identical with this species.

27. *Barbus eumystus*, sp. n.

Depth of body equal to length of head, nearly 4 times in total length. Snout rounded, 3 times in length of head, eye 5 times, interorbital width 3 times; mouth inferior, its width $4\frac{1}{2}$ times in length of head; lips well developed, lower continuous across the chin and forming a small rounded median lobe; barbels two on each side, equal, twice and $\frac{1}{3}$ diameter of eye. Dorsal IV 9, free edge emarginate; last simple ray very strong, bony, not serrated, straight, $\frac{3}{6}$ length of head. Anal III 5. Pectoral a little shorter than head. Ventral below anterior rays of dorsal. Caudal peduncle once and $\frac{2}{3}$ as long as deep. Scales 31 $\frac{5\frac{1}{2}}{4\frac{1}{2}}$, $2\frac{1}{2}$ between lateral line and ventral, 12 round caudal peduncle. Dark olive above, silvery white beneath.

Total length 225 mm.

A single specimen from the Juju River, affluent of the Didessa River.

Remarkable for its very long barbels.

28. *Barbus nedgia*, Rüpp.—Didessa River, Gibe River, Gato River, Lake Ganjule (Margherita), Zuja River.

29. *Barbus Margaritæ*, sp. n.

Depth of body $3\frac{3}{4}$ to $4\frac{1}{3}$ times in total length, length of head $3\frac{1}{2}$ to $3\frac{3}{4}$ times. Snout rounded, 3 to $3\frac{1}{4}$ times in length of head, diameter of eye 4 (young) to 7 times, interorbital width 3 to $3\frac{1}{4}$ times; mouth inferior, its width 4 to 5 times in length of head; lips strongly developed, lower continuous across the chin and forming a short, rounded, median lobe; barbels two on each side, anterior 1 to $1\frac{1}{3}$, posterior $1\frac{1}{3}$ to $1\frac{2}{3}$ diameters of eye. Dorsal IV 8–9, free edge emarginate, last simple ray very strong, bony, not serrated, straight or slightly curved, $\frac{1}{2}$ to $\frac{3}{4}$ length of head. Anal III 5. Pectoral $\frac{2}{7}$ to $\frac{4}{7}$ length of head. Ventral below anterior rays of dorsal. Caudal peduncle once and $\frac{1}{2}$ to once and $\frac{3}{4}$ as long as deep. Scales 30–33 $\frac{5\frac{1}{2}}{4\frac{1}{2}-5\frac{1}{2}}$, $2\frac{1}{2}$ between lateral line and ventral, 12 round caudal peduncle. Dark olive above, the scales blackish at the base, white beneath.

Total length 285 mm.

Four specimens from Lake Ganjule (Margherita).

Very closely allied to *B. nedgia*, Rüpp.; distinguished by the absence of triangular rostral and mental lobes.

30. *Barbus alticola*, sp. n.

Depth of body $3\frac{1}{4}$ to $3\frac{1}{2}$ times in total length, length of head 4 times. Snout rounded, 3 to $3\frac{1}{2}$ times in length of head; diameter of eye 6 times in length of head, interorbital width 3 times; mouth inferior, its width 4 times in length of head; lips moderately developed, lower continuous across the chin; anterior barbel once and $\frac{1}{3}$ to once and $\frac{1}{2}$ diameter of eye, posterior barbel once and $\frac{2}{3}$ to once and $\frac{3}{4}$. Dorsal IV 9, free edge strongly emarginate; last simple ray very strong, bony, not serrated, feebly curved, $\frac{2}{3}$ length of head. Anal III 5. Pectoral a little shorter than head. Ventral below anterior rays of dorsal. Caudal peduncle once and $\frac{1}{2}$ to once and $\frac{2}{3}$ as long as deep. Scales 28–29 $\frac{4\frac{1}{2}}{4\frac{1}{2}}$, 2 between lateral line and ventral, 10 or 12 round caudal peduncle. Silvery grey above, the scales darker at the base, white beneath.

Total length 300 mm.

Three specimens from the Alaba River.

Agrees with *B. labiatus*, Blgr., in the large size of the scales; differs in the longer barbels and the absence of labial lobes.

31. *Barilius Loati*, Blgr.—Zendo River.

Siluridæ.

32. *Clarias lazera*, C. & V.—Sire River.

33. *Clarias Robecchii*, Vincig.—Elgo River.

34. *Heterobranchus longifilis*, C. & V.—Cojeb River, Ergino River.

35. *Schilbe mystus*, C. & V.—Sagan River.

36. *Bagrus docmac*, Forsk.—Ergino River, Sagan River.

37. *Synodontis schall*, Forsk. (*Smithii*, Gthr.).—Sagan River, Lake Ganjule (Margherita).

38. *Synodontis frontosus*, Vaill. (*Citernii*, Vincig.).—Lake Rudolf.

Cichlidæ.

39. *Tilapia nilotica*, L.—Ergino River, Lake Rudolf, Lake Ganjule (Margherita), Lakes Zwai and Suksuki.